

OREGON COASTAL NONPOINT PROGRAM  
NOAA/EPA PROPOSED FINDING

C. ADDITIONAL MANAGEMENT MEASURES-FORESTRY

PURPOSE OF MANAGEMENT MEASURE: The purpose of this management measure is to identify additional management measures necessary to achieve and maintain applicable water quality standards and protect designated uses for land uses where the 6217(g) management measures are already being implemented under existing nonpoint source programs but water quality is still impaired due to identified non-point sources.

CONDITIONS FROM JANUARY 1998 FINDINGS: Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures (1998 Findings, Section X)

PROPOSED FINDING: Oregon has not satisfied this condition. By not satisfying the additional management measure for forestry, Oregon has failed to submit an approvable program under CZARA.

RATIONALE

(Draft Rationale for Forest Roads)

*Forestry Road Additional Management Measure*

Oregon has established both regulatory and voluntary measures to address roads associated pollutant impacts to water quality, and suggested that additional management measures for roads are not necessary at this time. Oregon provided that regulatory changes made in 2002 and 2003 by the Board of Forestry to general road maintenance measures for improving water quality include the: (1) establishment of a "Critical Locations" Policy for avoiding the building of roads in critical locations such as high hazards landslide areas, steep slopes, or within 50 feet of waterbodies; (2) creation of additional rules to address wet-weather hauling (OAR 629-625-0700), and (3) revision of an existing road drainage rule to reduce sediment delivery (OAR 629-625-0330).

Oregon provided that the legacy roads issue (roads constructed and used prior to adoption of the Oregon Forest Practices Act (FPA) in 1971, not used or maintained since, and not required to be treated and stabilized before closure) is addressed by voluntary efforts carried out through the Oregon Plan for Salmon and Watersheds. In March 2014, the state described ODF's voluntary Road Hazard and Identification and Risk Reduction Project where private and state forestland owners survey their road networks to identify roads that pose risks to salmonid habitat and prioritize roads for remediation, and that legacy roads have been the target of significant landowner investment. Oregon reported that thousands of road miles have been inspected and repaired across the state since the inception of the voluntary program in 1997 and that millions of dollars have been spent to improve roads. However, the state did not indicate the impact the program has had within the coastal nonpoint program management area or how many of these projects addressed active forest roads and roads retired according to current FPA practices versus problems associated with older, legacy roads.

Oregon also noted it has entered into a cooperative agreement with the USDA Forest Service to update the state's geographic information system (GIS) data layer for forest roads. The data layer will help the state conduct a rapid road survey to evaluate and prioritize road risks to soil and water resources. Oregon noted it hoped to begin the survey in 2014. NOAA and EPA encourage the state to move forward with the road survey. However, the federal agencies are not aware if the survey and GIS layer will consider legacy roads or how the state will use the data to direct future management actions.

The state also discussed it was undertaking a third-party audit this year to assess compliance with the FPA rules governing forest road construction and maintenance among other things. While NOAA and EPA encourage the state to continue to conduct this and other audits to assess compliance with FPA rules, as noted earlier, the concern with legacy roads is that they are not subject to FPA rules, and issues resulting from legacy roads would not be observed during this audit.

While the cited improvements will help reduce sedimentation from roadways, NOAA and EPA remain concerned that a significant percentage of the road network on forest lands in Oregon continues to deliver sediment into streams. The identified rule changes and new policies do not sufficiently address water quality problems associated with the existing network of roads where construction or reconstruction is not proposed (e.g., roads that do not meet current state requirements with respect to siting, construction, maintenance, and road drainage) or with "legacy" roads. NOAA and EPA are also concerned that the new drainage requirements are triggered only when new road construction or re-construction of existing roads occurs.

As noted in the Oregon Coastal Coho Assessment<sup>1</sup>, old roads make up the majority of roads, and road inventory data on private land is not widely available. As such it is not possible to determine the extent to which voluntary efforts have addressed the sedimentation problems and landslide risk posed by the legacy road network.

Legacy roads remain an issue due to their location and construction. Historic settlement patterns and relative ease-of-construction led early developers to preferentially locate roads in valley bottoms near streams. These roads would often parallel low gradient streams (historically the most productive coho habitat) and cross many tributaries<sup>2</sup>. Prior to modern BMPs, mid-slope roads would often be connected to these valley bottom roads to access harvest units<sup>3</sup>. It is widely recognized that these poorly designed forest roads increase sediment supplied to streams by altering hillslope hydrology, surface runoff, and sediment flux<sup>4,5,6,7,8</sup>. These roads can also become a chronic source of low level sediment

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<sup>1</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon. 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 3B. 49 pp.

<sup>2</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon. 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 1: Synthesis. 69 pp.

<sup>3</sup> Wemple, B.C., Swanson, F.J., Jones, J.A., 2001. Forest roads and geomorphic process interactions, Cascade range, Oregon. *Earth Surface Processes and Landforms* 26, 191-204

<sup>4</sup> Reid, L. M., Dunne, T., 1984. Sediment production from forest road surfaces. *Water Resources Research* 20(11), 1753-1761.

<sup>5</sup> Luce, C.H., Black, T.A., 1999. Sediment production from forest roads in western Oregon. *Water Resources Research* 35(8), 2561-2570

over time<sup>9</sup>. The ecological consequences of sediment chronically supplied from roads may be equally or even more detrimental over time than periodic sediment pulses<sup>10</sup>. Furthermore, legacy roads can serve as initiation points for landslides many years (or even decades) after construction.<sup>11</sup> For example, Sessions (1987) found that forestry roads in Oregon built before 1984, have higher landslide rates than those built later.<sup>12</sup>

ODF's 2002 Sufficiency Analysis found that, except for wet weather road use which the Board has since addressed (see above), complying with the current FPA road best management practices (except those for wet weather road use which have since be updated) is likely to meet water quality standards, the analysis did not examine the impacts of legacy roads which do not adhere to current forest practices.

Oregon's Independent Multidisciplinary Science Team (IMST) found that "'Old roads and railroad grades' on forestlands, sometimes called legacy roads, are not covered by the OFPA rules unless they are reactivated for a current forestry operation or purposes. IMST believes the lack of a mechanism to address the risks presented by such roads is a serious impediment to achieving the goals of the Oregon Plan. A process that will result in the stabilization of such roads is needed, with highest priority attention to roads in core areas, but with attention to such roads and railroad grades at all locations on forestlands over time."<sup>13</sup> As part of the development process for the Coastal Salmon Restoration Initiative (CSRI) report, which later evolved in to the Oregon Plan for Salmon and Watershed (Oregon Plan), a September 10, 1996, National Marine Fisheries Service (NMFS) memo from Rowan Baker to Steve Morris and Elizabeth Garr, titled "Analysis of the Oregon Department of Forestry's (ODF) Most Recent Submission for the State of Oregon's Coastal Salmon Restoration Initiative" identifies the omission of "roads related problems" as a serious inadequacy. NMFS indicated that the forest practice rules have no well-defined process to identify problems with older logging roads and railroad grades constructed prior to 1994.<sup>14</sup>

In addition to water quality impacts, studies and reports have noted the harmful impacts of sedimentation and erosion from forestry roads on salmon. A study in 1980 found that logging roads are a source for fine sediments which enter spawning gravels and can lower

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<sup>6</sup> Wemple, B.C., Jones, J.A., 2003. Runoff production on forest roads in a steep, mountain catchment. *Water Resources Research* 39, doi:10.1029/2002WR001744

<sup>7</sup> Skaugset, A. and M. M. Allen. 1998. Forestry Road Sedimentation Drainage Monitoring Project for Private and State Lands in Western Oregon. Prepared for the Oregon Department of Forestry by the Forestry Engineering Department, Oregon State University, February 20, 1998.

<sup>8</sup> E.G Robison, K Mills, J Paul, L Dent, A Skaugset. 1999. Storm Impacts and Landslides of 1996: Final Report, Forest Practices Technical Report, vol. 4 Oregon Department of Forestry, Corvallis. 145 pp.

<sup>9</sup> L.H. MacDonald, D.B.R. Coe. 2008. Road sediment production and delivery: processes and management. *Proceedings of the First World Landslide Forum, International Programme on Landslides and International Strategy for Disaster Reduction, United Nations University, Tokyo, Japan.* pp. 381–384.

<sup>10</sup> Detenbeck, N.E. , P.W. Devore, G.J. Niemi, and A. Lima. 1992. Recovery of temperate stream fish communities from disturbance: a review of case studies and synthesis of theory. *Environ. Manage.* 16:33-53.

<sup>11</sup> Sufficiency Analysis 2002

<sup>12</sup> Sessions (1987) from Sufficiency Analysis.

<sup>13</sup> P. 47 of IMST

<sup>14</sup>

the success of spawning and recruitment for coho salmon.<sup>33</sup> More recently, NOAA National Marine Fisheries Services' scientific analysis for their Endangered Species Act Section 7 listing for Oregon Coast Coho Salmon, continue to recognize forestry roads, including legacy roads, as a source of sediment and a threat Oregon coastal coho salmon. NMFS explained that "existing and legacy [forestry] roads can contribute to continued stream degradation over time through restriction of debris flows, sedimentation, restriction of fish passage, and loss of riparian function."<sup>35</sup>

The suite of voluntary programs Oregon has described may enable the state satisfy the forestry roads element of this condition. However, additional information is needed at this time. As the federal agencies' *1998 Final Administration Changes Memo* states, in order for states to rely on voluntary programs to meet coastal nonpoint program requirements, a state must, among other things: (1) describe the voluntary program, including the methods for tracking and evaluating those programs, the State will use to encourage implementation of the management measures; and (2) provide a legal opinion from its Attorney General asserting the State has adequate back-up enforcement authority for the voluntary measures and commit to exercising the back-up authority when necessary. While the State has provided the federal agencies with a legal opinion detailing the suitability of its back-up authorities, the State has not provided (either in writing or through past practice) a commitment to exercise its back-up authority to require implementation of the additional management measures for forestry roads, as needed. Also, the State has not described specifically how these voluntary efforts have and will continue to address legacy road issues within the coastal nonpoint management area. Nor has the state fully described how it continue to monitor and track the implementation of these measures to address forestry road issues, including legacy roads (not just through one-time compliance audits but through more routine monitoring practices).

The federal agencies encourage the State to move forward with establishing a road survey or inventory program that considers both active, inactive, and legacy roads. To support an approvable coastal nonpoint program, the program should establish, among other things, a timeline for addressing priority road issues, including retiring or restoring forest roads that impair water quality, and a reporting and tracking component to assess progress for remediating identified forest road problems. Establishing a roads inventory with appropriate reporting metrics would provide valuable information on State and private landowner accomplishments to improve and repair roads and identify where further efforts are needed. Such an approach could help verify whether the combination of current rules and the Oregon Plan's voluntary measures are effective in managing forest roads to protect streams on a reasonable timeframe.

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<sup>33</sup> Cederholm, C.J., Reid, L.M., Salo, E.O. 1980. "Cumulative Effects of Logging Road Sediment on Salmonid Populations In the Clearwater River, Jefferson County, Washington, Contribution No. 543, College of Fisheries, University of Washington, Seattle, Washington 98195

<sup>35</sup> NOAA National Marine Fisheries Service. 2012. Scientific Conclusions of the Status Review for Oregon Coast Coho Salmon (*Oncorhynchus kisutch*). NOAA Technical Memorandum NMFS-NWFSC-118, June 2012. Pg. 78  
[http://www.nwfsc.noaa.gov/assets/25/1916\\_08132012\\_121939\\_SROregonCohoTM118WebFinal.pdf](http://www.nwfsc.noaa.gov/assets/25/1916_08132012_121939_SROregonCohoTM118WebFinal.pdf)



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CONDITIONS FROM JANUARY 1998 FINDINGS: Within two years, Oregon will identify and begin applying additional management measures where water quality impairments and degradation of beneficial uses attributable to forestry exist despite implementation of the 6217(g) measures (1998 Findings, Section X)

PROPOSED FINDING: Oregon has not satisfied this condition. By not satisfying the additional management measure for forestry, Oregon has failed to submit an approvable program under CZARA.

RATIONALE

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(<http://coast.noaa.gov/about/staff/> Draft Rationale for Forest Roads):  
Forestry Road Additional Management Measure

**Comment [AC1]:** For consistency in style with how we write the decision rationales, I think it would be good to look to the rationales Don drafted for new devel and OSDS.

Oregon has established both regulatory and voluntary measures to address roads associated pollutant impacts to water quality, and suggested that additional management measures for roads are not necessary at this time. Oregon provided that regulatory changes made in 2002 and 2003 by the WBoard of Forestry to general road maintenance measures for improving water quality include the: (1) establishment of a "Critical Locations" Policy for avoiding the building of roads in critical locations such as high hazards landslide areas, steep slopes, or within 50 feet of waterbodies; (2) creation of additional rules to address wet-weather hauling (OAR 629-625-0700), and (3) revision of an existing road drainage rule to reduce sediment delivery (OAR 629-625-0330).

I don't think the current style of this rationale matches well. It focuses too much on reiterating what we stated in the proposed findings. We don't need to do that. We can just state X or Y. Use the Dec. 2013 proposed findings doc as a starting point, add some science up front to explain why add MM for roads are needed and make other adjustments to further strengthen the rationale based on the comments we received.

The decision rationale shouldn't include info on what we heard in the public comments. We can leave that for the response to comments document.

See suggestions below where I inserted the original proposed decision findings and flagged some areas that could be updated.

Oregon- provided that the ~~has proposed to address the legacy roads issue~~ (roads constructed and used prior to adoption of the Oregon Forest Practices Act (FPA) in 1971, not used or maintained since, and not required to be treated and stabilized before closure)s is addressed ~~by through voluntary efforts, including restoration and monitoring activities~~ ~~carried out through the voluntary Oregon Plan for Salmon and Watersheds. For example, in its March 2014 submittal, the state described ODF's voluntary Road Hazard and Identification and Risk Reduction Project where private and state forestland owners survey their road networks to identify roads that pose risks to salmonid habitat and prioritize roads for remediation, and that legacy roads have been the target of significant landowner investment. Oregon reported that thousands of road miles have been inspected and repaired across the state since the inception of the voluntary program in 1997 and that millions of dollars have been spent to improve roads. However, the state did not indicate the impact the program has had within the coastal nonpoint program management area or how many of these projects addressed active forest roads and roads retired according to current FPA practices versus problems associated with older, legacy roads.~~

**Comment [HA2]:** See the rewrite.

**Comment [HA3]:**

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Oregon also noted it has entered into a cooperative agreement with the USDA Forest Service to update the state's geographic information system (GIS) data layer for forest roads. The data layer will help the state conduct a rapid road survey to evaluate and prioritize road risks to soil and water resources. Oregon noted it hoped to begin the survey in 2014. NOAA and EPA encourage the state to move forward with the road survey. However, the federal agencies are not aware if the survey and GIS layer will consider legacy roads or how the state will use the data to direct future management actions.

The state also discussed it was undertaking a third-party audit this year to assess compliance with the FPA rules governing forest road construction and maintenance among other things. While NOAA and EPA encourage the state to continue to conduct this and other audits to assess compliance with FPA rules, as noted earlier, the concern with legacy roads is that they are not subject to FPA rules, and issues resulting from legacy roads would not be observed during this audit.

Although Oregon reports that thousands of road miles have been inspected and repaired across the state since the inception of this program in 1997, the state did not indicate the impact the program has had within the coastal nonpoint program management area or how many of these projects addressed active forest roads and roads retired according to current FPA practices versus problems associated with older, legacy roads.

Oregon also noted it has entered into a cooperative agreement with the USDA Forest Service to update the state's geographic information system (GIS) data layer for forest roads. The data layer will help the state conduct a rapid road survey to evaluate and prioritize road risks to soil and water resources. Oregon noted it hoped to begin the survey in 2014. NOAA and EPA encourage the state to move forward with the road survey. However, the federal agencies are not aware if the survey and GIS layer will consider legacy roads or how the state will use the data to direct future management actions. While the cited improvements will help reduce sedimentation from roadways, NOAA and EPA remain concerned that a significant percentage of the road network on forest lands in Oregon continues to deliver sediment into streams. The identified rule changes and new policies do not sufficiently address water quality problems associated with the existing network of roads where construction or reconstruction is not proposed (e.g., roads that do not meet current state requirements with respect to siting, construction, maintenance, and road drainage) or with "legacy" roads. NOAA and EPA are also concerned that the new drainage requirements are triggered only when new road construction or re-construction of existing roads occurs.

As noted in the Oregon Coastal Coho Assessment<sup>1</sup>, old roads make up the majority of roads, and road inventory data on private land is not widely available. As such it is not possible to determine the extent to which voluntary efforts have addressed the sedimentation problems and landslide risk posed by the legacy road network.

Legacy roads remain an issue due to their location and construction. Historic settlement patterns and relative ease-of-construction led early developers to preferentially locate roads in valley bottoms near streams. These roads would often parallel low gradient

<sup>1</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon, 2005, Oregon Coastal Coho Assessment, Coho Assessment Part 3B, 49 pp.

**Comment [AC4]:** If we can say more about status, that could be helpful but we should let what the state provides speak for itself. Don't spend a lot of time learning about what this survey program will or won't do and how far along is it. That's the state's responsibility.

**Comment [AC5]:** If we can say more about status, that could be helpful but we should let what the state provides speak for itself. Don't spend a lot of time learning about what this survey program will or won't do and how far along is it. That's the state's responsibility.

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**Comment [AC6]:** Can we provide a more quantitative #? The 1998 Forest Rd. Sediment Drainage study only found that 33% of rd lengths in the Coast Range and 23% in the South Coast were identified as connected or possibly connected to waters of the state. 33% and 23% don't seem like a "significant percentage" to me? <http://www.oregon.gov/odf/privateforests/docs/roadsediment.pdf>

**Comment [HA7]:** The significance of the percentage plays out in a couple of ways; 1) as a percent of the whole, and 2) the level of sediment loading from that specific percentage. While 33% may not seem like a lot, those roads may contribute a very large percentage of the sediment load causing major water quality and beneficial uses' impacts. The biggest problem is that the State does not have a good inventory or monitoring program of the old roads that were not built to current standards. The roads exist but the State doesn't have data regarding the roads locations, road conditions, where fixes have been applied and how well the fixes are working. I will continue to look for more data to better characterize "significant percentage" but, for right now, I have found nothing to add to this

**Comment [AC8]:** We cite CSRI (1996) but what about more recent science to support this claim that roads "continue to deliver sediment" or will this have to be an unsupported statement?

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**Comment [HA9]:** You may want to review the information Teresa added. It does include more recent data.

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**Comment [AC10]:** If legacy roads are not specifically linked to water quality impairments (303(d) listed waters. May want to consider using alternative lang that is more defensible, such as "water quality problems associated with 'legacy roads'" ....

**Comment [HA11]:** I did make a minor change to the language.

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streams (historically the most productive coho habitat) and cross many tributaries<sup>2</sup>. Prior to modern BMPs, mid-slope roads would often be connected to these valley bottom roads to access harvest units<sup>3</sup>. It is widely recognized that these poorly designed forest roads increase sediment supplied to streams by altering hillslope hydrology, surface runoff, and sediment flux<sup>4,5,6,7,8</sup>. These roads can also become a chronic source of low level sediment over time<sup>9</sup>. The ecological consequences of sediment chronically supplied from roads may be equally or even more detrimental over time than periodic sediment pulses<sup>10</sup>. Furthermore, legacy roads can serve as initiation points for landslides many years (or even decades) after construction.<sup>11</sup> For example, Sessions (1987) found that forestry roads in Oregon built before 1984, have higher landslide rates than those built later.<sup>12</sup>

ODF's 2002 Sufficiency Analysis found that, except for wet weather road use which the Board has since addressed (see above), complying with the current FPA road best management practices (except those for wet weather road use which have since be updated) is likely to meet water quality standards, the analysis did not examine the impacts of legacy roads which do not adhere to current forest practices.

Oregon's Independent Multidisciplinary Science Team (IMST) found that "Old roads and railroad grades' on forestlands, sometimes called legacy roads, are not covered by the OFPA rules unless they are reactivated for a current forestry operation or purposes. IMST believes the lack of a mechanism to address the risks presented by such roads is a serious impediment to achieving the goals of the Oregon Plan. A process that will result in the stabilization of such roads is needed, with highest priority attention to roads in core areas, but with attention to such roads and railroad grades at all locations on forestlands over time."<sup>13</sup> As part of the development process for the Coastal Salmon Restoration Initiative

Comment [AC12]: Where does this quote end?

Comment [HA13]: At the end of the paragraph

<sup>2</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon, 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 1: Synthesis. 69 pp.

<sup>3</sup> Wemple, B.C., Swanson, F.J., Jones, J.A., 2001. Forest roads and geomorphic process interactions, Cascade range, Oregon. *Earth Surface Processes and Landforms* 26, 191-204

<sup>4</sup> Reid, L. M., Dunne, T., 1984. Sediment production from forest road surfaces. *Water Resources Research* 20(11), 1753-1761.

<sup>5</sup> Luce, C.H., Black, T.A., 1999. Sediment production from forest roads in western Oregon. *Water Resources Research* 35(8), 2561-2570

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<sup>11</sup> Sufficiency Analysis 2002

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<sup>13</sup> P. 47 of IMST



(CSRI) report, which later evolved in to the Oregon Plan for Salmon and Watershed (Oregon Plan), a September 10, 1996, National Marine Fisheries Service (NMFS) memo from Rowan Baker to Steve Morris and Elizabeth Garr, titled "Analysis of the Oregon Department of Forestry's (ODF) Most Recent Submission for the State of Oregon's Coastal Salmon Restoration Initiative" identifies the omission of "roads related problems" as a serious inadequacy. NMFS indicated that the forest practice rules have no well-defined process to identify problems with older logging roads and railroad grades constructed prior to 1994.<sup>14</sup>

**Comment [AC14]:** Memo to who?

**Comment [HA15]:** See revision

The EPA and NOAA recognize that legacy roads are being addressed through voluntary measures, and that legacy roads have been the target of significant landowner investment. However, as noted in the Oregon Coastal Coho Assessment<sup>15</sup>, old roads make up the majority of roads, and road inventory data on private land is not widely available. As such it is not possible to determine the extent to which voluntary efforts have addressed the sedimentation problems and landslide risk posed by the legacy road network. In the 1998 conditional approval findings, NOAA and EPA called out specific concerns with the ability of Oregon's existing EPA rules to adequately address road density and maintenance, particularly on so-called "legacy" roads, to attain water quality standards and protect designated uses. In the rationale, NOAA and EPA noted that "legacy" roads, roads constructed and used prior to adoption of the FPA in 1971 and not used or maintained since, were not required to be treated and stabilized before closure. In some locations, this has resulted in significantly altered surface drainage, diversion of water from natural channels, and serious erosion or landslides.<sup>16</sup>

**Comment [AC16]:** Is this specifically forestry roads or more broadly all types of roads? I've seen several reports, including NMFS coho listing, that lump all roads together but it's hard to tease out impacts of forestry roads and legacy forestry roads from there. Unless we can tie specifically to forest roads, I'm not sure how helpful the general discussions of all roads will be for us.

**Comment [HA17]:** The comment and the "roads discussion" pertains to the State's Forest Practice Rules and how the rules lack a well defined process to identify problems with older logging roads and railroad grades constructed under previous forest practices (prior to 1994). The discussion is on forest roads.

**Comment [AC18]:** Ok but is that having an impact on salmon and water quality? We need to make that connection.

**Comment [HA19]:**

**Comment [HA20]:** I added a 1980 study that found sediment from logging roads negatively impacted coho salmon spawning.

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Legacy roads remain an issue due to their location and construction. Forestry roads, including legacy roads, are a concern because forestry road construction and use contribute sediment to streams and can cause landslides.<sup>16,17</sup> Historic settlement patterns and relative ease-of-construction led early developers to preferentially locate roads in valley bottoms near streams. These roads would often parallel low gradient streams (historically the most productive coho habitat) and cross many tributaries<sup>18</sup>. Prior to modern BMPs, mid-slope roads would often be connected to these valley bottom roads to access harvest units<sup>19</sup>. It is widely recognized that these poorly designed forest roads increase sediment supplied to streams by altering hillslope hydrology, surface runoff, and sediment flux.<sup>20,21,22</sup> Forestry roads, including legacy roads, are a

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<sup>15,16</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon. 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 3B. 49 pp.

<sup>16</sup> Skaugset, A. and M. M. Allen. 1998. Forestry Road Sedimentation Drainage Monitoring Project for Private and State Lands in Western Oregon. Prepared for the Oregon Department of Forestry by the Forestry Engineering Department, Oregon State University, February 20, 1998.

<sup>17</sup> Robison, \*\*\*\*, 1999. \*\*\*\* [landslide paper]

<sup>18</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon. 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 1: Synthesis. 69 pp.

<sup>19</sup> Wemple, B.C., Swanson, F.L., Jones, J.A. 2001. Forest roads and geomorphic process interactions. Gascade range, Oregon. Earth Surface Processes and Landforms 26, 191-204.

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concern because forestry road construction and use contribute sediment to streams and can cause landslides.<sup>23,24</sup> These roads can alsoAlthough most roadway erosion occurs a few years after construction or during heavy use, become a chronic source of low level sediment over time<sup>25</sup>. The ecological consequences of sediment chronically supplied from roads may be equally or even more detrimental over time than periodic sediment pulses<sup>26</sup>. Furthermore, legacy roads can serve as initiation points for landslides can occur many years (and or even decades) after construction.<sup>27</sup> For example, Sessions (1987) found that forestry roads in Oregon built before 1984, have higher landslide rates than those built later.<sup>28</sup>

Although most roadway erosion occurs a few years after construction or during heavy use, landslides can occur many years (and even decades) after construction.<sup>29</sup> For example, Sessions (1987) found that forestry roads in Oregon built before 1984, had higher landslide rates than those built later.<sup>30</sup>

The EPA and NOAA recognize that legacy roads are being addressed through voluntary measures, and that legacy roads have been the target of significant landowner investment. However, as noted in the Oregon Coastal Coho Assessment<sup>31</sup>, old roads make up the majority of roads, and road inventory data on private land is not widely available. As such it is not possible to determine the extent to which voluntary efforts have addressed the sedimentation problems and landslide risk posed by the legacy road network.

We also recognize that Since 1998, the Board of Forestry has made several improvements to general road maintenance measures to improve water quality. Changes made in 2002 and 2003, included: (1) establishment of a "Critical Locations" Policy for avoiding the

Research 20(11): 1753-1761.

<sup>21</sup> Luce, C.H., Black, T.A., 1999. Sediment production from forest roads in western Oregon. *Water Resources Research* 35(8): 2561-2570.

<sup>22</sup> Wemple, B.C., Jones, J.A., 2003. Runoff production on forest roads in a steep, mountain catchment. *Water Resources Research* 39. doi:10.1029/2002WR001744.

<sup>23</sup> Skaugset, A. and M. M. Allen, 1998. Forestry Road Sedimentation Drainage Monitoring Project for Private and State Lands in Western Oregon. Prepared for the Oregon Department of Forestry by the Forestry Engineering Department, Oregon State University, February 20, 1998.

<sup>24</sup> E.G. Robison, K. Mills, J. Paul, L. Dent, A. Skaugset, 1999. Storm Impacts and Landslides of 1996. Final Report, Forest Practices Technical Report, vol. 4 Oregon Department of Forestry, Corvallis, 145 pp.

<sup>25</sup> L.H. MacDonald, D.B.R. Goe, 2008. Road sediment production and delivery: processes and management. *Proceedings of the First World Landslide Forum, International Programme on Landslides and International Strategy for Disaster Reduction, United Nations University, Tokyo, Japan*, pp. 381-384.

<sup>26</sup> Detenbeck, N.E., P.W. Devore, G.J. Niemi, and A. Lima, 1992. Recovery of temperate stream fish communities from disturbance: a review of case studies and synthesis of theory. *Environ. Manage.* 16:33-53.

<sup>27</sup> Sufficiency Analysis 2002

<sup>28</sup> Sessions (1987) from Sufficiency Analysis.

<sup>29</sup> Sufficiency Analysis 2002

<sup>30</sup> Sessions (1987) from Sufficiency Analysis.

<sup>31</sup> Jay Nicholas, Bruce McIntosh and Ed Bowles, Oregon Watershed Enhancement Board and Oregon Department of Fish and Wildlife, Salem, Oregon, 2005. Oregon Coastal Coho Assessment. Coho Assessment Part 3B, 49 pp.

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building of roads in critical locations such as high hazards landslide areas, steep slopes, or within 50 feet of waterbodies; (2) creation of additional rules to address wet-weather hauling (OAR 629-625-0700), and (3) revision of an existing road drainage rule to reduce sediment delivery (OAR 629-625-0330).

These improvements will help reduce sedimentation from roadways. However, as noted above, NOAA and EPA remain concerned that a significant percentage of the road network on forest lands in Oregon continues to deliver sediment into streams, and that new drainage requirements are triggered only when new road construction or re-construction of existing roads occurs. The rule changes and new policies do not sufficiently address water quality problems associated with "legacy roads" (e.g., roads that do not meet current state requirements with respect to siting, construction, maintenance, and road drainage) or problems associated with a large portion of the existing road network where construction or reconstruction is not proposed.

While ODF's 2002 Sufficiency Analysis found that, except for wet-weather road use which the Board has since addressed (see above), complying with the current EPA road best management practices (except those for wet-weather road use which have since be updated) is likely to meet water quality standards, the analysis did not examine the impacts of legacy roads which do not adhere to current forest practices. Oregon's Independent Multidisciplinary Science Team (IMST) did find that "[Old roads and railroad grades] on forestlands, sometimes called legacy roads, are not covered by the OFPA rules unless they are reactivated for a current forestry operation or purposes. IMST believes the lack of a mechanism to address the risks presented by such roads is a serious impediment to achieving the goals of the Oregon Plan. A process that will result in the stabilization of such roads is needed, with highest priority attention to roads in core areas, but with attention to such roads and railroad grades at all locations on forestlands over time."<sup>32</sup>

[Any more recent science of legacy rds contributing to sediment to mention before we get into salmon issues? How about basins in the coastal nonpoint management area are on 303(d) list for sediment or completed sediment TMDLs for some Rogue and Umpqua Watersheds...anything there we could use?]

In addition to water quality impacts, several studies and reports have noted the harmful impacts of sedimentation and erosion from forestry roads on salmon. A study in 1980 found that logging roads are a source for fine sediments which enter spawning gravels and can lower the success of spawning and recruitment for coho salmon.<sup>33</sup> For example, as part of the development process for the Coastal Salmon Restoration Initiative (CSRI) report, which later evolved in to the Oregon Plan for Salmon and Watershed (Oregon Plan), a September 10, 1996, National Marine Fisheries Service (NMFS) memo commenting on the draft CSRI report identifies the reports omission of "roads related problems" as a serious inadequacy. NMFS indicated that the forest practice rules have no well-defined process to identify problems with older logging roads and railroad grades constructed prior to 1994.<sup>34</sup> NMFS also indicated that the proposed CSRI measures to address roads, (i.e., ODF CSRI measures

**Comment [AC21]:** Can we provide a more quantitative #? The 1998 Forest Rd. Sediment Drainage study only found that 33% of rd lengths in the Coast Range and 23% in the South Coast were identified as connected or possibly connected to waters of the state. 33% and 23% don't seem like a "significant percentage" to me? <http://www.oregon.gov/odf/privateforests/docs/roadsediment.pdf>

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**Comment [AC22]:** We cite CSRI (1996) but what about more recent science to support ... [1]

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**Comment [AC23]:** If legacy roads are not specifically linked to water quality impairm ... [2]

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**Comment [AC24]:** Where does this quote end?

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**Comment [AC25]:** This rationale is for roads. Don't need to mention landslides and ripar ... [3]

**Comment [HA26]:** I assume you removed the "landslides and riparian" language since it ... [4]

**Comment [AC27]:** If we're going to say "many reports" we need to provide more citations ... [5]

**Comment [HA28]:** I added the 1980 study; should we add more? I will try to find a m ... [6]

**Comment [HA29]:**

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**Comment [AC30]:** Memo to who?

**Comment [HA31]:** See revision

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**Comment [AC32]:** Is this specifically forestry roads or more broadly all types of roads? I ... [7]

**Comment [HA33]:** The comment and the "roads discussion" pertains to the State's F ... [8]

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**Comment [AC34]:** Ok but is that having an impact on salmon and water quality? We n ... [9]

**Comment [HA35]:**

**Comment [HA36]:** I added a 1980 study that found sediment from logging roads negati ... [10]

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<sup>32</sup> P. 47 of IMST

<sup>33</sup> Cederholm, C.J., Reid, L.M., Salo, E.O. 1980. "Cumulative Effects of Logging Road Sediment on Salmonid Populations In the Clearwater River, Jefferson County, Washington, Contribution No. 543, College of Fisheries, University of Washington, Seattle, Washington 98195

<sup>34</sup>

1-3 for culverts, stream crossings, skid trails, and ODF measure 10 for voluntary identification of high risk erosion sites, apply to roads post-1994 construction (for measures 1-3) and post-1973 construction (for measure 10).<sup>35</sup>

More recently, NOAA National Marine Fisheries Services' scientific analysis for their Endangered Species Act Section 7 listing for Oregon Coast Coho Salmon, continue to recognize forestry roads, including legacy roads, as a source of sediment and a threat Oregon coastal coho salmon. NMFS explained that "existing and legacy [forestry] roads can contribute to continued stream degradation over time through restriction of debris flows, sedimentation, restriction of fish passage, and loss of riparian function."<sup>35</sup>

Oregon has proposed to address the legacy road issues through voluntary efforts, including restoration and monitoring activities carried out through the voluntary Oregon Plan. For example, in its March 2014 submittal, the state described ODF's voluntary Road Hazard and Identification and Risk Reduction Project where private and state forestland owners survey their road networks to identify roads that pose risks to salmonid habitat and prioritize roads for remediation. Although Oregon reports that thousands of road miles have been inspected and repaired across the state since the inception of this program in 1997, the state did not indicate the impact the program has had within the coastal nonpoint program management area or how many of these projects addressed active forest roads and roads retired according to current FPA practices versus problems associated with older, legacy roads.

Oregon also noted it has entered into a cooperative agreement with the USDA Forest Service to update the state's geographic information system (GIS) data layer for forest roads. The data layer will help the state conduct a rapid road survey to evaluate and prioritize road risks to soil and water resources. Oregon noted it hoped to begin the survey in 2014. NOAA and EPA encourage the state to move forward with the road survey. However, the federal agencies are not aware if the survey and GIS layer will consider legacy roads or how the state will use the data to direct future management actions.

[Add something on family forest land...helpful but not enough by itself....what percentage of forest land in cnp area is covered by family forest land?]

In addition, the state also discussed it was undertaking a third-party audit this year to assess compliance with the FPA rules governing forest road construction and maintenance among other things. While NOAA and EPA encourage the state to continue to conduct this and other audits to assess compliance with FPA rules, as noted earlier, the concern with legacy roads is that they are not subject to FPA rules issues resulting from legacy roads would not be observed during this audit.

<sup>35</sup> NOAA National Marine Fisheries Service. 2012. Scientific Conclusions of the Status Review for Oregon Coast Coho Salmon (*Oncorhynchus kisutch*). NOAA Technical Memorandum NMFS-NWFSC-118, June 2012. Pg. 78  
[http://www.nwfsc.noaa.gov/assets/25/1916\\_08132012\\_121939\\_SROregonCohoTM118WebFinal.pdf](http://www.nwfsc.noaa.gov/assets/25/1916_08132012_121939_SROregonCohoTM118WebFinal.pdf)

**Comment [AC37]:** Where is this measure?

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**Comment [AC38]:** I find this confusing as written. I assume NMFS is commenting on draft CSRI measures? Therefore referring to measures 1-3, etc isn't that helpful because, as written, we don't know if the final measures in the 1997 CSRI report reflect these draft measures. After reviewing the CSRI, I don't see anything comparable in there. Let's talk through what you're trying to say and see if there's a better way to phrase it.

**Comment [AC39]:** I don't think this adds anything. Just restates a fact that we've already noted. Can add date of 1971 to definition of legacy roads in opening para to provide further clarification.

**Comment [AC40]:** This is NMFS assessment. We need to make our own conclusions based on science, not have others do the thinking for us.

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**Comment [AC41]:** While helpful background for an issue paper. I see this "memo" as the equivalent as an email correspondence these days. We need to refer the actual scientific studies, not personal correspondence that is not formally published (we raise concerns with industry/state relying too heavily on paired watershed study, partly for that reason, we can't change course and do that here.

**Comment [HA42]:** Allison, your comment seems to apply/link to NMFS's scientific analysis. This is not a memo. It is the agency's Scientific conclusion on the Status review of the coastal coho. Is the comment correctly "linked" to the appropriate part of the narrative?

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**Comment [AC43]:** If we can say more about status, that could be helpful but we should let what the state provides speak for itself. Don't spend a lot of time learning about what this survey program will or won't do and how far along is it. That's the state's responsibility.

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The suite of voluntary programs Oregon has described may enable the state satisfy the forestry roads element of this condition. However, additional information is needed at this time. As the federal agencies' *1998 Final Administration Changes Memo* states, in order for states to rely on voluntary programs to meet coastal nonpoint program requirements, a state must, among other things: (1) describe the voluntary program, including the methods for tracking and evaluating those programs, the State will use to encourage implementation of the management measures; and (2) provide a legal opinion from its Attorney General asserting the State has adequate back-up enforcement authority for the voluntary measures and commit to exercising the back-up authority when necessary. While the State has provided the federal agencies with a legal opinion detailing the suitability of its back-up authorities, the State has not provided (either in writing or through past practice) a commitment to exercise its back-up authority to require implementation of the additional management measures for forestry roads, as needed. Also, the State has not described specifically how these voluntary efforts have and will continue to address legacy road issues within the coastal nonpoint management area. Nor has the state fully described how it continue to monitor and track the implementation of these measures to address forestry road issues, including legacy roads (not just through one-time compliance audits but through more routine monitoring practices).

The federal agencies encourage the State to move forward with establishing a road survey or inventory program that considers both active, inactive, and legacy roads. To support an approvable coastal nonpoint program, the program should establish, among other things, a timeline for addressing priority road issues, including retiring or restoring forest roads that impair water quality, and a reporting and tracking component to assess progress for remediating identified forest road problems. Establishing a roads inventory with appropriate reporting metrics would provide valuable information on State and private landowner accomplishments to improve and repair roads and identify where further efforts are needed. Such an approach could help verify whether the combination of current rules and the Oregon Plan's voluntary measures are effective in managing forest roads to protect streams on a reasonable timeframe.

In the 1998 conditional approval findings, NOAA and EPA called out specific concerns with the ability of Oregon's existing EPA rules to adequately address road density and maintenance, particularly on so-called "legacy" roads, to attain water quality standards and protect designated uses. In the rationale, NOAA and EPA noted that "legacy" roads, roads constructed and used prior to adoption of the EPA in 1971 and not used or maintained since, were not required to be treated and stabilized before closure. In some locations, this has resulted in significantly altered surface drainage, diversion of water from natural channels, and serious erosion or landslides."

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**Page 6: [1] Comment [AC22]** **Allison Castellan** **9/23/2014 5:24:00 PM**

We cite CSRI (1996) but what about more recent science to support this claim that roads “continue to deliver sediment” or will this have to be an unsupported statement?

**Page 6: [2] Comment [AC23]** **Allison Castellan** **9/23/2014 5:24:00 PM**

If legacy roads are not specifically linked to water quality impairments (303(d) listed waters. May want to consider using alternative lang that is more defensible, such as “water quality problems associated with ‘legacy roads’” ....

**Page 6: [3] Comment [AC25]** **Allison Castellan** **9/23/2014 5:24:00 PM**

This rationale is for roads. Don’t need to mention landslides and riparian issues here.

**Page 6: [4] Comment [HA26]** **Henning, Alan** **10/8/2014 3:11:00 PM**

I assume you removed the “landslides and riparian” language since it no longer appears in the paragraph

**Page 6: [5] Comment [AC27]** **Allison Castellan** **9/23/2014 5:24:00 PM**

If we’re going to say “many reports” we need to provide more citations that just CSRI.

**Page 6: [6] Comment [HA28]** **Henning, Alan** **10/10/2014 11:21:00 AM**

I added the 1980 study; should we add more? I will try to find a more recent study to add here as well.

**Page 6: [7] Comment [AC32]** **Allison Castellan** **9/23/2014 5:24:00 PM**

Is this specifically forestry roads or more broadly all types of roads? I’ve seen several reports, including NMFS coho listing, that lump all roads together but it’s hard to tease out impacts of forestry roads and legacy forestry rds from there. Unless we can tie specifically to forest roads, I’m not sure how helpful the general discussions of all roads will be for us.

**Page 6: [8] Comment [HA33]** **Henning, Alan** **10/9/2014 4:26:00 PM**

The comment and the “roads discussion” pertains to the State’s Forest Practice Rules and how the rules lack a well defined process to identify problems with older logging roads and railroad grades constructed under previous forest practices (prior to 1994). The discussion is on forest roads.

**Page 6: [9] Comment [AC34]** **Allison Castellan** **9/23/2014 5:24:00 PM**

Ok but is that having an impact on salmon and water quality? We need to make that connection.

**Page 6: [10] Comment [HA36]** **Henning, Alan** **10/10/2014 11:12:00 AM**

I added a 1980 study that found sediment from logging roads negatively impacted coho salmon spawning.